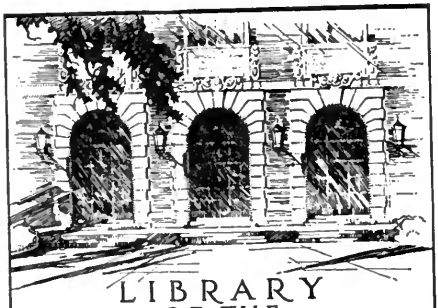
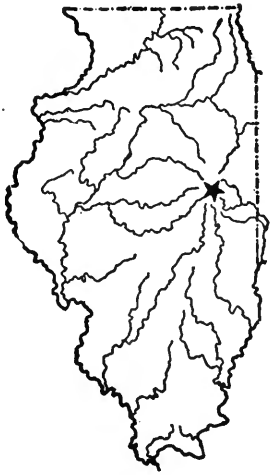


UNIVERSITY OF ILLINOIS
Agricultural Experiment Station

BULLETIN No. 287

SPRING WHEAT PRODUCTION IN ILLINOIS

By Robert W. Stark



URBANA, ILLINOIS, MARCH, 1927

SUMMARY

Spring wheat is grown to a limited extent in all parts of Illinois but is a crop of some importance only in the northern and central sections. Data secured from the DeKalb and Urbana experiment fields indicate that it is less remunerative than corn and winter wheat but more profitable than oats.

Marquis is recommended for both the northern and central sections. Other red spring varieties which in recent years have given satisfactory yields are Blue Ribbon, Kota, and Progress. The latter has been tested one year only.

Rate-of-seeding experiments have yielded variable results. The Station uses approximately 2 bushels an acre in the variety trials and finds that a satisfactory amount. Wheat sown in 4-inch drill rows produced a three-year average of 18.7 bushels an acre compared with 16.8 bushels produced when sown in 8-inch drill rows.

In date-of-seeding experiments conducted at Urbana for five years, wheat sown March 1, or as soon thereafter as possible, yielded more grain than did the later seedings and the grain was usually of better quality.

Spring wheat may be advantageously used as a substitute for winter wheat when weather conditions in the fall have prevented sowing the latter. Usually it is grown as a substitute for oats and follows corn. Old cornstalks are infested with the fungus which causes wheat scab. It is advisable, therefore, either to choose another place to sow spring wheat or to carefully plow under the stalks.

The seed bed may be prepared by thoroly disking and harrowing the ground if spring wheat is sown on land which the previous year was in some clean cultivated crop such as corn or soybeans. A better method, however, is to first plow the land and then pulverize and compact the soil with a disk and harrow. The grain may be sown either with a disk drill or an end-gate seeder. The disk drill is preferable.

While spring wheat is a cool weather plant, grown chiefly in the northern third of the state, it may also be grown with a fair degree of success on the fertile, well-drained soils of the central section extending south to an irregular and indefinite line drawn between Edgar and Pike counties.

SPRING WHEAT PRODUCTION IN ILLINOIS

By Robert W. Stark, Associate in Crop Production

Spring wheat is one of the minor cereals produced in Illinois. Notwithstanding its limited production, however, there continues to be considerable interest manifested in the crop, judging by the requests for information about it received by the Experiment Station each year. Interest naturally is greater in years when unfavorable weather has prevented farmers from sowing their usual acreage of winter wheat.

As a cash grain crop spring wheat deserves a more important place in Illinois agriculture than it now has. Illinois farmers are in need of a spring-sown cereal which may displace at least a portion of the oat acreage. Spring wheat is well suited for this purpose since it usually makes an excellent nurse crop for the clovers and also is capable, under favorable conditions, of yielding a larger cash return to the acre than oats.

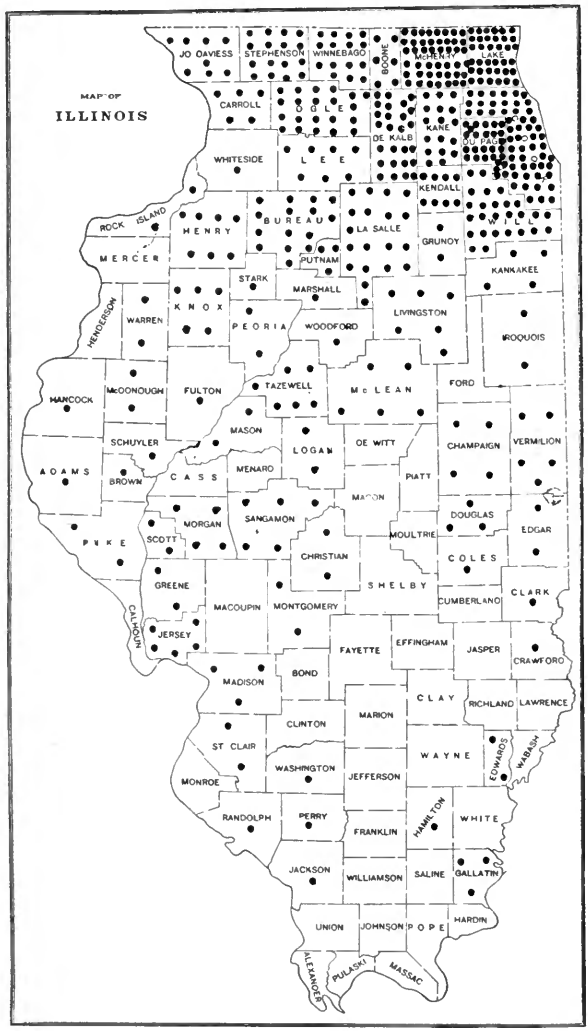
Some conception of the gross acre value of spring wheat as compared with the most important cereal crops produced in the central and northern sections of Illinois, where most of the spring wheat is grown, may be gained from Table 1. On the field at DeKalb winter wheat ranks first in gross acre value, corn second, spring wheat third, and oats fourth. The margin in favor of spring wheat as compared with oats amounted to nearly $7 an acre. Compared with corn, the gross acre value of spring wheat was only about $4.50 less. It is true that the yield of corn was considerably reduced two years of the ten, because of its immaturity when caught by freezing temperatures,

Table 1.—Acre Yields and Values of Cereals Grown on the Illinois Experiment Fields at DeKalb and Urbana

Crop	Yield per acre		Value per acre	
	DeKalb	Urbana	DeKalb	Urbana
	bu.	*bu.*		
Corn	54.9	69.0	$38.15	$47.96
Winter wheat	35.6	39.1	43.34	47.60
Spring wheat	27.6	24.8	33.60	30.19
Oats	66.8	54.2	26.72	21.68

The DeKalb yields are the averages for the ten-year period 1915 to 1919 and 1921 to 1925. The Urbana data represent the ten-year averages from 1916 to 1925. The acre values are calculated from the average estimated farm prices December 1 during the four years 1922 to 1925. The prices for these four years are used in order to eliminate the abnormally high prices which existed during and just after the war and the very low prices at the time of the deflation.

but this is a hazard which has to be reckoned with in northern Illinois. At Urbana, located in the heart of the corn belt, corn and winter wheat



DISTRIBUTION OF SPRING WHEAT IN 1925

Spring wheat is grown chiefly in the northern third of the state and more especially in the northeast district. It may also be grown successfully on the fertile soils of the central section as far south as Douglas, Sangamon, and Morgan counties. On the above map each dot represents 100 acres. The total area sown in the state in 1925 amounted to 46,000 acres and the estimated farm value, December 1, was $1,334,000. (Data taken from Circular 349, Illinois Crop and Live Stock Statistics.)

were practically on a par in gross acre value, spring wheat ranked second, while oats yielded nearly $8.50 less than spring wheat.

Inasmuch as the cost of growing an acre of spring wheat is not greatly in excess of that of growing oats, and both crops require labor at the same season of the year, a larger production of spring wheat as a substitute for oats in central and northern Illinois would seem justifiable.

VARIETY TESTS IN NORTHERN ILLINOIS

DeKalb in DeKalb County

Variety trials of spring wheat have been conducted regularly since 1915 on the crop experiment field at DeKalb in DeKalb county.

On this field spring wheat is grown in a four-year rotation consisting of corn, spring cereals (oats, spring wheat, and barley), winter wheat, and alsike clover. The soil is a fertile, dark-colored silt loam characteristic of much of that section. In this rotation spring wheat follows corn, and it has been the practice to plow the field in preparation for the spring cereals. If possible, the plowing was done in the fall after the corn was husked. The grain was sown with an 8-inch disk drill. The usual rate of seeding has been with the gage set to sow two bushels of seed to an acre.

In these trials Marquis (Tables 2 and 3) has out-yielded all other varieties grown for two years or more. It has proved to be adapted to a wide range of conditions, having been reported grown in all the northern and central states from the Atlantic to the Pacific coasts. Abundant supplies of seed are available. It is also a good milling wheat and has a reputation for producing flour of excellent quality.

Progress has made an excellent preliminary showing. It was grown on the DeKalb field for the first time in 1926 and made the highest yield of any variety. It ripened earlier than Marquis and contained much less scab. It would be unwise, however, to draw definite conclusions from one year's experience with it.

Blue Ribbon made excellent yields also. It was discontinued after two years because of its resemblance to Illinois No. 1.

Seed of the Kota variety, secured from the North Dakota Experiment Station in 1924, gave satisfactory yields but they were not equal to the yields of Marquis. In 1925 a second lot of Kota wheat of exceptional quality was purchased from the same source. Sufficient seed was secured to sow in 1925 and again in 1926. This second lot nearly equaled Marquis in average yield during the two years.

At this same time a quantity of Marquis wheat also was procured from the North Dakota Station. This was good seed but not nearly so attractive in appearance as the Kota. In neither 1925 nor in 1926 was the crop from it so large as that produced by the original stock of Marquis which was continuously grown in these experiments and used as the standard for comparison.

TABLE 2.—DEKALB FIELD: ANNUAL YIELDS OF VARIETIES OF SPRING WHEAT AND PERCENTAGE RATING USING MARQUIS AS THE STANDARD FOR COMPARISON

(Bushels per acre)

Year and date of seeding	1915 Apr. 9	1916 Apr. 18	1917 Apr. 24	1918 Apr. 5	1919 Apr. 10	1921 Apr. 11	1922 Apr. 21	1923 Apr. 24	1924 Apr. 21	1925 Apr. 9	1926 Apr. 24	Percentage rating[1]
Progress	....	....	....	....	....	....	....	....	....	....	28.2	115.1
Marquis	**30.6**	**34.7**	**32.0**	**42.0**	**18.6**	**10.6**	**20.6**	**28.7**	**30.7**	**27.2**	**24.5**	**100.0**
Blue Ribbon	....	....	....	....	....	....	....	29.2	28.8	....	....	97.6
Kota (North Dakota seed)[2]	....	....	....	....	....	....	....	....	....	27.5	22.5	96.5
Illinois No. 1	....	....	20.5	37.5	14.2	11.0	23.7	28.9	30.5	34.1	23.9	95.5
Durum	....	....	17.3	44.4	20.9	8.0	25.3	....	....	....	....	93.6
White Australian	....	....	....	....	....	....	....	....	....	....	22.6	92.2
Kota	....	....	....	....	....	....	....	....	27.5	25.4	20.8	89.4
Marquis (North Dakota seed)[2]	....	....	....	....	....	....	....	....	....	26.0	20.0	88.8
Velvet Chaff	....	....	....	....	....	9.1	....	....	....	....	....	85.8
Wisconsin Wonder	....	....	....	....	....	10.6	14.5	16.7	22.6	23.6	....	74.7
Bluestem	19.6	21.3	28.5	29.6	9.5	....	....	....	....	....	....	68.7
Red Bobs	....	....	....	....	....	7.2	....	....	....	....	....	67.9

[1]Marquis is taken as the standard for comparison; its rating is therefore 100 percent. The average yield of each of the other varieties divided by the average yield of Marquis for the same years represents their ratings.

[2]In 1925, a sufficient quantity of Kota and Marquis wheat was secured from the North Dakota Experiment Station to use as seed for two years. The purpose was not so much to test the yielding ability of northern-grown seed as to determine the effect of a change of soil and climate upon the quality of the resulting crop. The Kota seed was of unusually good quality and out-yielded the home-grown seed each year.

TABLE 3.—DEKALB FIELD: COMPARABLE AVERAGE YIELDS OF VARIETIES OF SPRING WHEAT USING MARQUIS AS A STANDARD FOR COMPARISON

(Bushels per acre)

Varieties	Number of years compared	Years on which comparisons are based	Average yield
Marquis	9	1917–1926 except 1920	26.1
Illinois No. 1	9	1917–1926 except 1920	24.9
Marquis	5	1915–1919	31.6
Bluestem	5	1915–1919	21.7
Marquis	5	1917–1922 except 1920	24.8
Durum	5	1917–1922 except 1920	23.2
Marquis	5	1921–1925	23.6
Wisconsin Wonder	5	1921–1925	17.6
Marquis	3	1924–1926	27.5
Kota	3	1924–1926	24.6
Marquis	2	1923, 1924	29.7
Blue Ribbon	2	1923, 1924	29.0
Marquis	2	1925, 1926	25.9
Kota (N. D. grown)	2	1925, 1926	25.0
Marquis (N. D. grown)	2	1925, 1926	23.0
Marquis	1	1921	10.6
Red Bobs	1	1921	7.2
Velvet Chaff	1	1921	9.1
Marquis	1	1926	24.5
White Australian	1	1926	22.6
Progress	1	1926	28.2

VARIETY TESTS IN CENTRAL ILLINOIS

URBANA IN CHAMPAIGN COUNTY

At Urbana spring wheat is grown in a four-year rotation of corn for two years, spring cereals, and red clover. The soil is a fertile, dark-colored silt loam representing large areas in central Illinois. Marquis has competed on this field with practically the same varieties as at DeKalb. It has been exceeded in yield by Illinois No. 1, White Australian, Durum, and Wisconsin Wonder (Tables 4 and 5).

Illinois No. 1 has the highest rating for yield. Over a period of twelve years it has averaged 1.7 bushels an acre in excess of Marquis. While the yearly differences have not been great, they have been fairly consistent, Marquis having been outyielded in nine years of the twelve. From information now available choice of varieties for central Illinois lies between these two varieties. It should be noted, however, that

TABLE 4.—URBANA FIELD: ANNUAL YIELDS OF VARIETIES OF SPRING WHEAT AND PERCENTAGE RATINGS USING MARQUIS AS THE STANDARD FOR COMPARISON

(Bushels per acre)

Year and date of seeding	1915 Apr. 5	1916 Apr. 11	1917 Mar. 30	1918 Mar. 27	1919 Mar. 28	1920 Apr. 23	1921 Mar. 18	1922 Apr. 23	1923 Mar. 28	1924 Mar. 28	1925 Mar. 9	1926 Mar. 24	Percentage rating[1]
Illinois No. 1	19.6	27.9	43.1	26.7	14.6	19.5	20.4	.7	10.5	36.1	28.1	34.7	107.6
White Australian	....	....	....	....	....	....	....	....	22.5	36.9	25.7	29.0	104.6
Durum	14.4	24.6	31.9	27.6	14.8	18.2	28.9	.3	7.7	....	....	....	101.1
Wisconsin Wonder	....	....	....	....	....	....	18.9	1.7	23.4	26.9	20.6	....	100.7
Marquis	**14.6**	**21.8**	**36.3**	**25.1**	**18.2**	**20.6**	**15.9**	**.3**	**13.7**	**33.7**	**27.3**	**34.4**	**100.0**
Kota (North Dakota seed)[2]	....	....	....	....	....	....	....	....	....	....	29.0	30.4	96.3
Progress	....	....	....	....	....	....	....	....	....	....	....	33.1	96.2
Marquis (North Dakota seed)[2]	....	....	....	....	....	....	....	....	....	....	27.2	28.5	90.3
Blue Ribbon	....	....	....	....	....	....	....	....	11.2	33.4	22.3	....	89.6
Kota	....	....	....	....	....	....	....	....	....	27.0	26.7	28.1	85.7
Red Fife	6.4	18.3	36.6	24.5	8.7	6.5	....	....	....	....	....	....	73.9
Dicklow	....	....	....	....	....	....	....	....	....	....	....	19.5	56.7

[1]Marquis is taken as the standard for comparison, its rating is therefore 100 percent. The average yield of each of the other varieties divided by the average yield of Marquis for the same years represents their ratings.

[2]In 1925, a sufficient quantity of Kota and Marquis wheat was secured from the North Dakota Experiment Station to use as seed for two years. The purpose was not so much to test the yielding ability of northern-grown seed as to determine the effect of a change of soil and climate upon the quality of the resulting crop. The Kota seed was of unusually good quality and out-yielded the home-grown seed each year.

TABLE 5.—URBANA FIELD: COMPARABLE AVERAGE YIELDS OF SPRING WHEAT USING MARQUIS AS A STANDARD FOR COMPARISON

(Bushels per acre)

Varieties	Number of years compared	Years on which comparisons are based	Average yield
Marquis	12	1915–1926	21.8
Illinois No. 1	12	1915–1926	23.5
Marquis	9	1915–1923	18.5
Durum	9	1915–1923	18.7
Marquis	6	1915–1920	22.8
Red Fife	6	1915–1920	16.8
Marquis	5	1921–1925	18.2
Wisconsin Wonder	5	1921–1925	18.3
Marquis	4	1923–1926	27.3
White Australian	4	1923–1926	28.5
Marquis	3	1923–1925	24.9
Blue Ribbon	3	1923–1925	22.3
Marquis	3	1924–1926	31.8
Kota	3	1924–1926	27.3
Marquis	2	1925–1926	30.9
Marquis (N. D. seed)	2	1925–1926	27.9
Kota (N. D. seed)	2	1925–1926	29.7
Marquis	1	1926	34.4
Progress	1	1926	33.1
Dicklow	1	1926	19.5

Progress, grown for the first time in 1926, appears promising. It yielded nearly as much as Illinois No. 1 and produced grain of excellent quality testing 63.3 pounds to the bushel.

A practical drawback to Illinois No. 1, however, is that it is almost impossible to secure seed. The Experiment Station has distributed small quantities from time to time, but has been unable to keep a record of the growers. Few farmers grow spring wheat continuously, and hence stocks are easily lost. Apparently some of the wheat being grown in the state under the name Illinois No. 1 came from some source other than the Experiment Station.

Illinois No. 1 is a mixture of two varieties, a white chaff and a brown chaff variety, both bearded. A mass selection of each of these varieties has been made and it is proposed to test them thoroly. If one or both of these maintain the record made by the mixture, it is hoped that it may be possible to distribute pure seed within a few years.

Wisconsin Wonder is an early variety of only medium-yielding capacity. Its relatively high average yield during the five-year period

it was grown was due to its early maturity in 1923. That year the spring wheat varieties were cut early (some of them when very immature) in order to get the grain off the land and permit the destruction of chinch bugs. Because of its earliness and short straw, it is an excellent variety to use as a nurse crop.

Durum wheat has given quite satisfactory yields both at Urbana and at DeKalb. It does not seem advisable, however, to recommend it for Illinois. Durum does not usually bring as good a price as the ordinary bread wheats and if mixed with other classes of wheat would lower their value.

White Australian seems very well adapted to the central section of the state. It is a white wheat, however, and practically no white wheat is at present grown in Illinois. Unless grown in sufficient quantity and shipped in carlots, it would find its way to market mixed with red wheat, thereby lowering the class and the price of the whole. Unless the growing of this variety should become an established custom in certain localities, it seems doubtful whether it would be advisable to grow it at all in Illinois.

RATE OF SEEDING

Experiments have been conducted at DeKalb and at Urbana to determine the rate of seeding that will give the greatest net yield. The results obtained were somewhat erratic. Apparently considerable variation in the amount of seed sown will not greatly affect the net yield. In the ordinary routine testing of varieties of spring wheat it is the practice of the Station to set the drill gage to sow 2 bushels an acre.

DISTANCE OF SPACING ROWS

In a test of the relative merits of sowing wheat in drill rows 4 inches apart and 8 inches apart, conducted at Urbana for three years with Marquis, the 4-inch drill rows gave the slightly higher yield, producing a three-year average of 18.7 bushels an acre as against 16.8 bushels with the 8-inch drill rows (Table 6).

TABLE 6.—URBANA FIELD: YIELDS OBTAINED BY SOWING MARQUIS SPRING WHEAT IN 4-INCH AND IN 8-INCH DRILL ROWS

(Bushels per acre)

Distance between drill rows	1919	1920	1921	Average
4 inches	19.1	14.2	22.9	18.7
8 inches	16.9	11.9	21.5	16.8

DATE OF SEEDING SPRING WHEAT

The importance of sowing spring wheat early was demonstrated by a series of date of seeding experiments conducted at Urbana from 1918 to 1922. In these experiments the first sowings were made as early in March as the condition of the soil would permit seeding with a drill. Thereafter seedings were made at intervals of as near to ten days as soil and weather conditions allowed. Close adherence to a definite time schedule was impossible, owing to the condition of the soil. At times the last seeding was delayed until the latter part of April, altho it was intended to sow not later than the first week of April.

It will be observed that the highest yield made by both Marquis and Illinois No. 1 was secured each year from the first seeding (Table 7). Not only was there a progressive decrease in yield with later seedings, but the quality of the crop usually declined, as shown by the weight per bushel.

During the five-year period covered by these tests, the average date of the first seedings was March 6. The average yields resulting were 24.9 bushels an acre with Marquis and 26.4 bushels with Illinois

TABLE 7.—URBANA FIELD: EFFECT OF DATE OF SEEDING UPON THE YIELD AND QUALITY OF SPRING WHEAT

Year	Date of seeding	Marquis			Illinois No. 1		
		Yield per acre	Test weight per bushel	Scab infection	Yield per acre	Test weight per bushel	Scab infection
		bu.	*lbs.*	*perct.*	*bu.*	*lbs.*	*perct.*
1918	March 6	29.6	59.0	2.0	28.9	60.8	1.0
1918	March 16	27.3	58.0	6.0	23.5	59.4	.8
1918	March 29	23.8	56.5	7.4	21.8	58.8	5.6
1918	April 10	22.2	54.8	14.8	....	....	...
1919	March 7	21.1	53.2	....	17.6	56.4	...
1919	March 21	18.5	53.1	....	17.0	56.1	...
1919	March 28	18.2	53.0	....	14.6	56.0	...
1919	April 8	10.6	53.5	....	12.9	55.1	...
1920	March 2	26.2	59.6	....	31.9	60.2	...
1920	April 15	22.4	57.9	....	26.4	59.3	...
1920	April 23	20.7	58.0	....	19.5	58.3	...
1921	March 1	27.8	54.9	....	30.3	57.4	...
1921	March 11	24.3	54.3	....	26.7	56.8	...
1921	March 22	15.9	52.0	....	20.4	56.3	...
1921	April 1	8.9	50.3	....	14.9	55.0	...
1922	March 13	19.8	55.3	....	23.1	58.5	...
1922	April 24	.3	....	....	.7	....	...

No. 1. The average yield produced by seed sown at the normal[1] date (about April 5) was 16.0 bushels for Marquis and 16.4 bushels for Illinois No. 1.

Danger of serious scab infection also becomes greater when the date of heading is delayed by late seeding. Marquis sown March 6, 1918, showed 2 percent scab infection. The amount of infection increased with each advance in the date of seeding until that sown on April 10 contained 14.8 percent infected heads. Illinois No. 1 exhibited the same condition tho not to the same degree. There is some evidence that it is not so susceptible to scab infection as is Marquis.

While it is strongly recommended that spring wheat be sown as early in the season as the condition of the soil will permit, it does not necessarily follow that a failure will result from later seedings. The average date of sowing spring wheat in the variety trials at Urbana during the years 1915 to 1926 was April 1. The average yield of Marquis during these years was 21.8 bushels an acre, while that of Illinois No. 1 was 23.5 bushels. At DeKalb, the average date of seeding during the same period was April 16. On this field Marquis averaged 26.1 bushels an acre and Illinois No. 1, 24.9 bushels. The seasons at DeKalb are normally about one week later than at Urbana.

PLACE OF SPRING WHEAT IN THE ROTATION

Spring wheat may be used at any place in the rotation where it is desired to grow a small grain. It may at times prove a desirable substitute for winter wheat when weather conditions the fall before prevent seeding the latter. It is, however, usually sown as a substitute for oats following corn. In the latter case there is considerable danger of serious scab infection unless the cornstalks are removed or plowed under. Scab is produced by the fungus *Gibberella saubinetii*, which also causes one form of root and stalk rot of corn. Old cornstalks infested with the fungus are one of the important sources of spores. These spores are distributed by the wind. Many of them lodge on the immature heads of wheat where, under proper climatic conditions, they grow, causing scab. Data secured during a season of serious scab infection showed that Illinois No. 1 was the least susceptible of the varieties being tested that year. The varieties ranked in the following order of susceptibility: Illinois No. 1, White Australian, Progress, Kota, Marquis.

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[1]Except during the first year, this date-of-seeding experiment was conducted on the same series of plots on which varieties of spring wheat, barley, and certain of the oats were grown. The date on which the grain in the variety tests was sown is taken as the *normal* time of seeding.

PREPARATION OF SEED BED AND METHOD OF SOWING

The ideal seed bed is one prepared as for winter wheat; i.e., the ground is plowed and all trash turned under, the soil thoroly pulverized and compacted below, and the surface soil made fine and loose. Such a condition seldom can be secured without considerable delay in seeding unless the land has been plowed the fall before. In this case double-disking and harrowing in the spring should put the soil in good condition.

It is particularly desirable, in the preparation of old corn ground for spring wheat, that the stalks be well turned under with the plow. If the ground has not been fall-plowed, valuable time may be saved in the spring by thoroly disking and harrowing without previous plowing. This method of preparing old corn ground for spring wheat will, however, afford a greater chance for serious scab infection.

A more even distribution of the seed and a more uniform covering may be secured by sowing spring wheat with a disk drill. This, however, calls for a fairly well-prepared seed bed. In order to get the wheat sown early, it may therefore at times prove advisable to sow with an end-gate seeder and cover with a disk and harrow.

WHERE MAY SPRING WHEAT BE GROWN

History records that spring wheat was the type of wheat grown by the early French colonists who settled on the Mississippi bottom lands in Madison, St. Clair, and Randolph counties. Eventually it was replaced by winter wheat. Government statistics, however, indicate that spring wheat is still grown to some extent thruout the length and breadth of the state. It is, however, a cool-weather plant and needs to make its growth largely before hot weather sets in. Hence it is now and probably will continue to be grown chiefly in the northern section of the state. This section may be approximately located north of a line drawn between the southern boundaries of Kankakee and Mercer counties.

Spring wheat may also be grown with considerable success on the fertile, well-drained soils of the central section, extending south to a somewhat indefinite line drawn between Edgar and Pike counties. South of this line, except on relatively small areas, it usually is impossible to sow it sufficiently early on account of the excessive moisture in the soil. Moreover, most varieties mature several days later than winter wheat, and therefore are more likely to be injured by hot weather and fungous diseases and by chinch bugs, which are always present in some parts of this section.

DESCRIPTION OF VARIETIES[1]

Including Origin and Performance[2] on Experiment Fields

Blue Ribbon. Synonym for Preston. Straw white or faintly purple; head bearded; chaff white, glabrous;[3] kernels red, hard.

Originated by Dr. William Saunders at the Central Experimental Farm, Ottawa, Canada, in 1888, from a cross between Ladoga, a Siberian wheat, and Red Fife.

Yields: two-year average at DeKalb 29.0 bushels, Marquis 29.7; three-year average at Urbana 22.3 bushels, Marquis 24.9.

Bluestem. Synonym for Haynes Bluestem. Straw white, long, medium strong; heads smooth; chaff white, pubescent or hairy, kernels red, hard.

Selected by Mr. L. H. Haynes of Fargo, North Dakota, about 1895 from a field of wheat known as Bluestem which had become mixed with soft and bearded varieties.

Yield: five-year average yield at DeKalb 21.7 bushels, Marquis 31.6.

Dicklow. Straw white, strong, coarse; head smooth; chaff white, glabrous; kernels white and soft.

Originated by Mr. Richard Low of Utah county, Utah, from a selection made from Surprise.

Yield: grown one year at Urbana 19.5 bushels, Marquis 34.4. Variety late and proved particularly susceptible to scab.

Durum. Variety unknown, probably Kubanka. Straw long, white; heads bearded; chaff yellowish, glabrous; kernels large and amber in color.

Kubanka was introduced from Russia.

Yields: nine-year average at Urbana 18.7 bushels, Marquis 18.5; five-year average at DeKalb 23.2 bushels, Marquis 24.8.

Illinois No. 1. Mixture of two varieties, one white chaff, the other brown chaff, both bearded; straw medium strong; kernels red; midseason.

Originated from seed secured in 1912 from a Champaign county farmer who had grown it successfully for a number of years.

Yield: twelve-year average at Urbana 23.5 bushels, Marquis 21.8; nine-year average at DeKalb 24.9 bushels, Marquis 26.1.

Kota. Straw white, weak to medium strong; head bearded; chaff white, glabrous; kernels red, hard.

Introduced into North Dakota from Russia; was selected from a lot of Durum wheat and found to be resistant to certain forms of rust and to produce flour of good quality.

Yield: three-year average at Urbana 27.3 bushels, Marquis 31.8; three-year average at DeKalb 24.6 bushels, Marquis 27.5.

Marquis. Straw white to yellowish, medium tall, very strong; heads smooth; chaff white, glabrous; kernels red, short, hard.

Originated by a cross made under the direction of Dr. William Saunders, Central Experimental Farm, Ottawa, Canada. The parents were Hard Red Calcutta and Red Fife. Selected and propagated largely because of its excellent bread-making qualities; it was found to be productive and adapted to a wide range of conditions.

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[1]For description of varieties and history of their origin, the writer has drawn freely upon Bulletin 1074 of the U. S. Department of Agriculture, "Classification of American Wheat Varieties," by J. Allen Clark, John H. Marten, and Carleton R. Ball. 1922.

[2]All yields are given in terms of bushels an acre. All comparisons are based on averages of the same season.

[3]Glabrous means free from hairs, differing from pubescent, which causes the chaff to appear velvety.

Yield: twelve-year average at Urbana 21.8 bushels; eleven-year average at DeKalb 27.3 bushels.

Progress. Straw white, medium strong; heads bearded; chaff white, glabrous; kernels red, soft; medium early.

Selected in 1916 from a field of Java by E. J. Deliviche of the Department of Agronomy of the University of Wisconsin. Under Wisconsin conditions proved superior to Marquis in yield.

Yield: one year at Urbana 33.1 bushels, Marquis 34.4; one year at DeKalb 28.2 bushels, Marquis 24.5.

Red Bobs. Straw white, strong; head smooth; chaff white, glabrous; kernels hard, red.

Selected by Mr. Seager Wheeler of Rosthern, Saskatchewan, in 1910 from a field of Bobs, a white wheat.

Yield: grown one year at DeKalb, produced 7.2 bushels, Marquis 10.6.

Red Fife. Straw white, strong; head smooth; chaff white, glabrous; kernels red, short to midlong, hard.

Selected about 1842 by Mr. David Fife of Otonabee, Ontario, from a small sample of winter wheat sown in the spring.

Yields: six-year average at Urbana 16.8 bushels, Marquis 22.8.

White Australian. Synonym for Pacific Bluestem. Straw white, strong; head smooth; chaff yellowish white, glabrous; kernels white, soft to semi-hard.

Introduced into California from Australia sometime during the fifties. Apparently identical with the White Lammas, at that time the most important wheat grown in Australia.

Yield: four-year average at Urbana 28.5 bushels, Marquis 27.3.

Wisconsin Wonder. Synonym for Prelude. Straw white, sometimes slightly purple, short, strong; heads bearded; chaff yellowish, pubescent (velvet chaff); kernels red, short, hard; very early maturing.

Originated by Dr. C. E. Saunders at the Central Experimental Farm, Ottawa, Canada. It is the result of a number of successive crosses. The parent varieties are Ladoga, White Fife, Hard Red Calcutta, and Gehun.

Yield: five-year average at Urbana 18.3 bushels, Marquis 18.2; five-year average at DeKalb 17.6 bushels, Marquis 23.6.

Velvet Chaff. Probably another name for Haynes Bluestem. Grown but one year at DeKalb.

Yield: 9.1 bushels, Marquis 10.6.